WE CLAIM:

1 A method for identifying a compound that modulates cell cycle 2 arrest, the method comprising the steps of:

- (i) contacting a cell comprising a target polypeptide selected from the
 group consisting of BRCA-1-Associated Protein-1 (BAP-1), Nuclear Protein 95 (NP95),
- 5 Fanconi anemia group A protein (FANCA), DEAD/H box polypeptide 9 (DDX9),
- 6 insulin-like growth factor 1 receptor (IGF1R), ubiquitin-conjugating enzyme E2 variant 1
- 7 (UBE2V1), aldehyde dehydrogenase, pyruvate kinase, glucose-6-phosphate
- 8 dehydrogenase, HCDR-3, DEAD/H box polypeptide 21 (DDX21), serine threonine
- 9 kinase 15 (ARK2), transmembrane 4 superfamily member 1, or ERCC1, or fragment
- thereof with the compound, the target polypeptide encoded by a nucleic acid that
- 11 hybridizes under stringent conditions to a nucleic acid encoding a polypeptide having an
- amino acid sequence a sequence selected from the group consisting of SEQ ID NO:2, 4,
- 13 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, and 28; and
- 14 (ii) determining the chemical or phenotypic effect of the compound upon 15 the cell comprising the target polypeptide or fragment thereof, thereby identifying a
- 16 compound that modulates cell cycle arrest.
- 1 2. The method of claim 1, wherein the chemical or phenotypic effect
- 2 is determined by measuring an activity selected from the group consisting of: helicase
- 3 activity, receptor tyrosine kinase activity, ubiquitination, ligase, ubiquitin hydrolase
- 4 activity, ubiquitin ligase activity, receptor binding activity, receptor cross-linking
- 5 acitivity, protease, and endonuclease.
- 1 3. The method of claim1, wherein the chemical or phenotypic effect
- 2 is determined by measuring cellular proliferation.
- 1 4. The method of claim 3, wherein the cell cycle arrest is measured by
- 2 assaying DNA synthesis or fluorescent marker level.
- 5. The method of claim 4, wherein DNA synthesis is measured by ³H thymidine incorporation, BrdU incorporation, or Hoescht staining.
- 1 6. The method of claim 4, wherein the fluorescent marker is selected 2 from the group consisting of a cell tracker dye or green fluorescent protein.

1		7.	The method of claim 1, wherein modulation is activation of cell		
2	cycle arrest.				
1		8.	The method of claim 1, wherein modulation is activation of cancer		
	call avala arm		The method of claim 1, wherein modulation is activation of cancer		
2	cell cycle arre	581.			
1		9.	The method of claim 1, wherein the host cell is a cancer cell.		
1		10.	The method of claim 9, wherein the cancer cell is a breast, prostate		
2	colon, or lung	g cancer	cell.		
		•			
1		11.	The method of claim 9, wherein the cancer cell is a transformed		
2	cell line.				
		12	The weether of eleies 11 subgrain the transformed call line is BC2		
1	*******	12.	The method of claim 11, wherein the transformed cell line is PC3,		
2	H1299, MDA-MB-231, MCF7, A549, or HeLa.				
1		13.	The method of claim 9, wherein the cancer cell is p53 null or		
2	mutant.				
_	muan.				
1		14.	The method of claim 9, wherein the cancer cell is p53 wild-type.		
1		15.	The method of claim 1, wherein the polypeptide is recombinant.		
1		16.	The method of claim 1, wherein the polypeptide is encoded by a		
2	nucleic acid comprising a sequence of SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23				
3	25, or 27.				
1		17.	The method of claim 1, wherein the compound is an antibody.		
•					
1	-	18.	The method of claim 1, wherein the compound is an antisense		
2	molecule.				
			<u>.</u>		
1		19 .	The method of claim 1, wherein the compound is an RNAi		
2	molecule.		•		
		00			
1		20 .	The method of claim 1, wherein the compound is a small organic		
2	molecule.				

1	21. The method of claim 1, wherein the compound is a peptide.				
1	22. The method of claim 21, wherein the peptide is circular.				
1	23. A method for identifying a compound that modulates cell cycle				
2	arrest, the method comprising the steps of:				
3	(i) contacting the compound with a target polypeptide selected from the				
4	group consisting of BRCA-1-Associated Protein-1 (BAP-1), Nuclear Protein 95 (NP95),				
5	Fanconi anemia group A protein (FANCA), DEAD/H box polypeptide 9 (DDX9),				
6	insulin-like growth factor 1 receptor (IGF1R), ubiquitin-conjugating enzyme E2 variant				
7	(UBE2V1), aldehyde dehydrogenase, pyruvate kinase, glucose-6-phosphate				
8	dehydrogenase, HCDR-3, DEAD/H box polypeptide 21 (DDX21), serine threonine				
9	kinase 15 (ARK2), transmembrane 4 superfamily member 1, or ERCC1, or fragment				
10	thereof, the target polypeptide encoded by a nucleic acid that hybridizes under stringent				
11	conditions to a nucleic acid encoding a polypeptide having an amino acid sequence a				
12	sequence selected from the group consisting of SEQ ID NO:2, 4, 6, 8, 10, 12, 14, 16, 18,				
13	20, 22, 24, 26, and 28;				
14	(ii) determining the physical effect of the compound upon the target				
15	polypeptide; and				
16	(iii) determining the chemical or phenotypic effect of the compound upon				
17	a cell comprising the target polypeptide or fragment thereof, thereby identifying a				
18	compound that modulates cell cycle arrest.				
1	24. A method of modulating cell cycle arrest in a subject, the method				
2	comprising the step of administering to the subject a therapeutically effective amount of				
3	compound identified using the method of claim 1.				
1	25. The method of claim 24, wherein the subject is a human.				
1	26. The method of claim 25, wherein the subject has cancer.				
1	27. The method of claim 24, wherein the compound is an antibody.				
1	28. The method of claim 24, wherein the compound is an antisense				
2	molecule.				

1		29.	The method of claim 24, wherein the compound is an Kivai			
2	molecule.					
1		30.	The method of claim 24, wherein the compound is a small organic			
2	molecule.	50.	The memory of claim 21, whereas the complete and a			
2	morecure.					
1		31.	The method of claim 24, wherein the compound is a peptide.			
1		32.	The method of claim 31, wherein the peptide is circular.			
1		32.	The medical of claim 51, wherein the popular to the transfer			
1		33.	The method of claim 24, wherein the compound inhibits cancer cell			
2	proliferation.					
1		. 34.	A method of modulating cell cycle arrests in a subject, the method			
2			of administering to the subject a therapeutically effective amount of a			
3	target polypeptide selected from the group consisting of BRCA-1-Associated Protein-1					
4	(BAP-1), Nuclear Protein 95 (NP95), Fanconi anemia group A protein (FANCA),					
5	DEAD/H box polypeptide 9 (DDX9), insulin-like growth factor 1 receptor (IGF1R),					
	ubiquitin-conjugating enzyme E2 variant 1 (UBE2V1), aldehyde dehydrogenase,					
6	pyruvate kinase, glucose-6-phosphate dehydrogenase, HCDR-3, DEAD/H box					
7	polypeptide 21 (DDX21), serine threonine kinase 15 (ARK2), transmembrane 4					
8						
9	-		1, or ERCC1, or fragment thereof, the target polypeptide encoded by			
10	a nucleic acid that hybridizes under stringent conditions to a nucleic acid encoding a					
11	polypeptide having an amino acid sequence a sequence selected from the group consisting					
12	of SEQ ID N	O:2, 4,	6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, and 28.			
1		35.	A method of modulating cell cycle arrest in a subject, the method			
2	comprising th	ne step o	of administering to the subject a therapeutically effective amount of a			
3	nucleic acid	encodin	g a target polypeptide selected from the group consisting of BRCA-			
4	1-Associated Protein-1 (BAP-1), Nuclear Protein 95 (NP95), Fanconi anemia group A					
5	protein (FAN	ICA), D	EAD/H box polypeptide 9 (DDX9), insulin-like growth factor 1			
6	receptor (IGI	71R), ut	piquitin-conjugating enzyme E2 variant 1 (UBE2V1), aldehyde			
7	dehydrogena	se, pyru	wate kinase, glucose-6-phosphate dehydrogenase, HCDR-3,			
8	DEAD/H box	c polype	eptide 21 (DDX21), serine threonine kinase 15 (ARK2),			
9	transmembra	ne 4 su	perfamily member 1, or ERCC1, or fragment thereof, the nucleic			

- 10 acid hybridizing under stringent conditions to a nucleic acid encoding a polypeptide
- having an amino acid sequence a sequence selected from the group consisting of SEQ ID
- 12 NO:2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26 and 28.